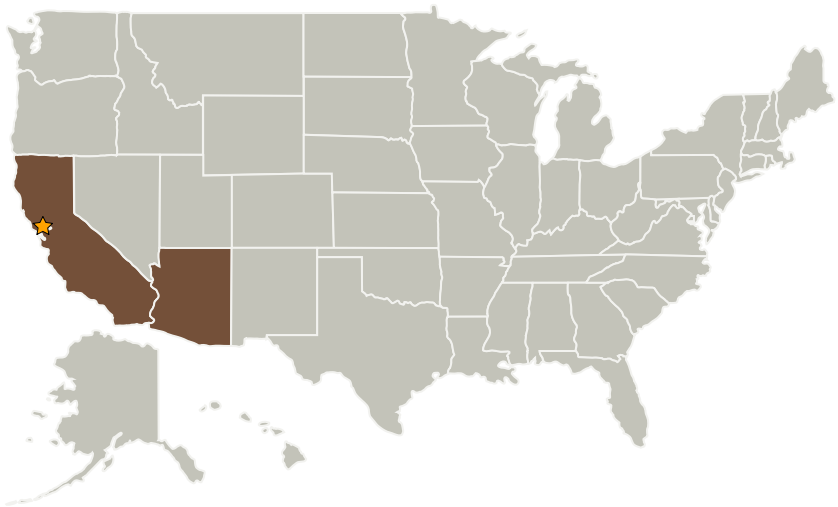
Prognostics-Enabled Power Supply for ADAPT Testbed, Phase II

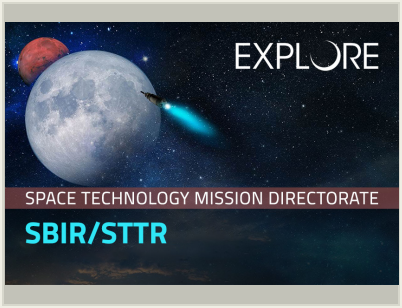
Completed Technology Project (2007 - 2009)

Project Introduction

Ridgetop's role is to develop electronic prognostics for sensing power systems in support of NASA/Ames ADAPT testbed. The prognostic enabled power systems from Ridgetop are to be integrated into NASA's Advanced Diagnostics and Prognostics Testbed (ADAPT) and later used in the Crew Exploration Vehicle (CEV). Prognostics will provide power supply "state of health", remaining useful life (RUL) and notify operators of impending failures so that load-shedding or orderly switch-overs can be supported. Using the ADAPT at NASA/Ames Research Center, Ridgetop will design, implement and validate a prototype prognostic sensor that employs both analog circuits and digital logic in a microcontroller unit (MCU) or microproprocessor controller (MPC) to "prognostics-enable" a high efficiency switching power converter. The ADAPT is a testbed, developed to explore health-management systems in manned spaceflight with three main goals: 1) to assess performance of diagnostic tools and algorithms against a standardized testbed and repeatable failure scenarios, 2) to develop prognostic models (performance degradation, remaining life estimation) for spacecraft subsystems, and 3) prototype Advanced Caution and Warning System (ACAWS) algorithms and user interfaces. By developing effective and practical prognostics for a power supply, Ridgetop's role will be to extend the capabilities of the ADAPT testbed.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Ridgetop Group, Inc.	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Tucson, Arizona

Primary U.S. Work Locations	
Arizona	California

Project Transitions

December 2007: Project Start

December 2009: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.3 Electrical Power Conversion and Regulation